



**Immediate Analytical Data Gaps  
Needed to Support the Libby Baseline Risk Assessment  
January 31, 2007**

Below are analytical data gaps related to completion of the Libby Baseline Risk Assessment. A brief description and cost estimates are provided below.

1. **Filter Studies.** Perform an evaluation of sample filter efficiency for collection of Libby Amphibole asbestos (LA). There are two potentially independent aspects to this evaluation: filter pore size comparisons (0.45  $\mu\text{m}$  and 0.8  $\mu\text{m}$ ), and filter composition comparisons (mixed cellulose ester [MCE] and polycarbonate [PC]).

- a. *Filter pore size comparisons.* Due to issues with filters clogging in the field during collection of air samples, a decision was made early in the Libby project to move from the method-recommended 0.45  $\mu\text{m}$  pore size filter to a 0.8  $\mu\text{m}$  pore size filter. Using the larger pore size filter helped to alleviate the problem with clogged filters was reduced; however, a study to determine any impact (e.g., LA fiber loss) associated with the method modification is required. The study would be performed in a laboratory setting where a range of known concentrations of LA are entrained in the air and captured on 0.45  $\mu\text{m}$  and 0.8  $\mu\text{m}$  pore size filters, respectively. The air filters shall then be characterized (both fiber size and mineralogy) to identify whether differences exist in fiber size distributions between the two pore sizes which in turn will inform any differences in LA concentration data collected from the different pore size filters.

Cost breakdown: 30 paired comparisons on 2 filter compositions (MCE & PC) 3 concentration levels (360 samples)

1. lab study: \$200K

2. analytical: \$500K

Total: \$700K

**INCLUDE RATIONALE FOR HOW THIS IS NECESSARY FOR COMPLETION OF BRA**

- b. *Filter composition comparisons.* Currently MCE filters are commonly used in field and laboratory settings for sampling and preparation. However, some literature suggests that PC filters may be more efficient for asbestos analysis. The study would characterize differences (biases) and/or differences in fiber size distribution between MCE and PC filters. The study will be performed in a laboratory setting where a range of known concentrations of LA are applied and/or entrained in the air and captured on the MCE and PC filters, respectively. The air filters shall then be characterized (both fiber size and mineralogy) to identify whether differences exist in fiber size distributions between the two filter compositions, which in turn will inform any differences in LA concentration data collected from the different filter types.

Cost breakdown: Folded into 1a, see above

2. **Fiber Size Distribution in Libby Vermiculite.** Establish the fiber size distribution of LA fibers entrained from Libby vermiculite. Perform a laboratory-based study that characterizes (both fiber size distribution and mineralogy) the fibers that are entrained into air. Compare the fiber size distribution in Libby vermiculite with fiber size distributions of other media in Libby (e.g., outdoor ambient air, indoor ambient air, dust, activity-based sampling [ABS] for activities carried out on Libby soils, ABS for activities carried out in attics with vermiculite attic insulation [VAI].)

Cost breakdown: 20 samples

1. lab study: \$75K

2. analytical: \$50K

Total: \$125K

3. **Low Level Soil Method Development & Validation.** Develop analytical tool(s) that are at minimum qualitative assessments of presence or absence of LA in soil at levels less than ~0.05% (by weight). Optimally, the analytical tool(s) would be quantitative in nature, but this is a long term challenge. This is best characterized as short- and long-term efforts: method validation efforts and method development, respectively.

- a. Validation of Region 10's Glove Box Method. Perform validation of Region 10's Glove Box method as applied to reference materials of Libby soil containing known amounts of LA. This will be a laboratory-based study to establish the sensitivity of the Glove Box method for LA. Reference materials shall be disturbed, allowing entrainment of LA into the air and . The LA in air is captured on filters (selected based upon results of study identified in Bullet #1) and then tested by EM (TEM and/or SEM) to determine whether the concentrations measured in the air filters approximates the known concentrations of the reference materials.

**SCREENING TOOL W/O ABS ON EVERY EXPOSURE AREA.**

Cost breakdown: 30 samples @ 3 concentrations (90 samples)

1. lab study: \$50K

2. analytical: \$150K

Total: \$200K

- b. General Method Development. Direct further method development work based upon validation activities and current work being carried out in Region 10.

1. Cost Estimate to initiate, but not necessarily complete: \$200K

4. **Comparison of Direct and Indirect Preparations.** Obtain additional data to compare LA concentrations measured using direct and indirect preparations for

Transmission Electron Microscopy (TEM) analysis to identify whether differences exist in fiber size distribution and/or total LA concentrations. The study will be performed in a laboratory and will be designed to supplement empirical Libby data for direct and indirect sample preparations. A range of LA concentrations will be applied to filters (selected based upon results of study identified in Bullet #1) in pairs. One filter from each pair shall be readied for TEM analysis (direct preparation). The 2<sup>nd</sup> filter of the pair shall be readied for TEM analysis using indirect preparation. The results of each pair shall be compared.

Cost breakdown: 30 paired samples @ 3 concentrations (180 samples)

1. lab study: \$50K
  2. analytical: \$300K
- Total: \$350K

- 5. Outdoor Ambient Air Collection Validation.** Perform a validation of air sample collection techniques used for the outdoor ambient air monitoring program. The study will be performed in a laboratory setting where a range of known concentrations of LA are entrained in the air and captured onto MCE filters that replicate the outdoor ambient air sampling approach currently applied at Libby (low air flow rates collected continuously over days).

Cost breakdown: 30 paired samples @ 3 concentrations (180 samples)

1. lab study: \$50K
  2. analytical: \$400K
- Total: \$450K